FROM THE LITERATURE

Periodically, articles appear in the literature that present clinically useful information or evaluate the performance of a material or piece of equipment. Because DIS believes that this type of research is of value to clinicians, we present a brief description of these articles to make you aware of them. The complete citation is provided so you can obtain the article if you are interested in reading it in its entirety.

IS EXPOSURE TO HEPATITIS A A POSSIBILITY IN DENTISTRY?

The presence of hepatitis A antibodies in dental workers, a seroepidemiologic study. Ashkenazi M, Chodik G, Littner M, Aloni H, Lerman Y. J Am Dent Assoc 2001;132:492-498.

Infection with the Hepatitis A virus (HAV) is a major health problem worldwide. HAV infection is usually self-limiting, but can cause significant morbidity resulting in hospitalization, and in rare cases can cause death from acute fulminant hepatitis. The disease, which increases in severity with age, is endemic in Africa, Asia, and Latin America. However, improvements in sanitation and socioeconomic conditions in developing countries, and the development of a vaccine, have helped reduce infection rates. Saliva has been shown to transmit HAV, but risk to dental workers is unclear.

The authors of this study recruited 115 members of the dental staff of Tel Aviv University to determine the seroprevalence of HAV antibodies (and hence, seropositivity) via serum analysis. Results showed that 51.3 percent of the dental workers had antibodies to HAV. Increased seropositivity was associated with increased number of years in dentistry. A number of other variables also appeared to be associated with higher seropositive rates. Some included increasing age, a greater number of children, a greater number of siblings, and a history of either having worked in a hospital and having treated children (i.e., pediatric dentists, orthodontists). Suspected routes of infection in the dental office include close personal contact, blood, saliva or saliva contaminated with blood. The HA vaccine has been shown to be very safe and highly immunogenic. The Centers for Disease Control and Prevention has recommended the vaccine for workers at high-risk for occupational exposure. **This study suggests that HAV may be a hazard to dental workers, with risk increasing as the number of years in dentistry increase. The authors believe in vaccinating dentists at risk, including those seronegative for HAV, those treating children routinely, and those working in a hospital.**

ANOTHER TOOL FOR PAINLESS DENTISTRY

Articaine hydrochloride: a study of the safety of a new amide local anesthetic. Malamed SF, Gagnon S, Leblanc D. J Am Dent Assoc 2001;132:177-185.

Articaine hydrochloride is an amide local anesthetic first synthesized in Germany in 1969. It has been used clinically there since 1976, however, the U.S. Food and Drug Administration only granted approval for the sale of the anesthetic in the United States in April 2000. Articaine is sold as Septocaine by Septodont in a 4% concentration with 1:100,000 epinephrine; a 1:200,000 epinephrine version is also available. This study reported on the results of three independent, controlled, multicenter studies of the safety and efficacy of 4% articaine with 1:100,000 epinephrine compared to that of 2% lidocaine with 1:100,000 epinephrine. Results indicated that the incidence of adverse events was comparable for the two anesthetics. **The authors concluded that 4% articaine with 1:100,000 epinephrine is a safe, well-tolerated, effective anesthetic with a low risk of toxicity comparable to that of other local anesthetics.**

SEALING AMALGAM MARGIN DEFECTS

Repair of non-carious amalgam margin defects. Roberts HW, Charlton DG, Murchison DF. Oper Dent 2001;26:273-276.

The presence of narrow and/or stained non-carious margin defects is not, in and of itself, a sufficient reason for replacing an amalgam restoration. However, clinicians often feel uncomfortable leaving such defects untreated. Rather than replacing the restoration, sealing the defect can often be an viable option. This laboratory study evaluated the microleakage seen with repaired amalgam margin defects sealed with a flowable resin composite. Standardized 40-micron-wide margin defects were produced in class I amalgam restorations in 36 extracted human molars. The restorations were then subjected to an accelerated laboratory aging process. The teeth were divided into three groups: Group 1) no defect treatment (control); Group 2) air abrasion of the defect, enamel and amalgam acid etching, and placement of Permaflow flowable composite (Ultradent); and Group 3) air abrasion of the defect, application of PQ1 bonding agent (Ultradent), and placement of the flowable composite. The teeth were thermocycled, sealed to within 1 mm of the repaired margins, and immersed in a dye for 24 hours.

Specimens were then section and leakage assessed. Results indicated that the flowable resin composite significantly reduced leakage compared to the control group. The use of the bonding agent did not affect the degree of leakage of the two repair groups. **The authors concluded that flowable resin composite may provide an adequate seal for selected non-carious amalgam margin defects.**

ANOTHER WATERLINE BOND STRENGTH STUDY

The effect of a dental unit waterline treatment regimen on the shear bond strength of resin-based composite. Knight JS, Davis SB, McRoberts JG. J Am Dent Assoc 2001;132:615-619.

Dental unit waterline contamination is a widespread phenomenon, and the dental literature is replete with methods and protocols to reduce, control, and monitor this contamination in the dental operatory. Some studies have suggested using diluted mouthwash continuously in a self-contained dental unit water system to improve water quality. One significant question concerning this technique is the effect on bond strengths of dental restorative materials. This study used Scope (Procter & Gamble) mouthwash concentrate diluted in distilled water in a self-contained water system. The purpose was to test the disinfectant to determine if it had any effects of bond strength of a resin-based composite to enamel and dentin. The authors bonded composite cylinders to enamel and dentin, after acid etching, and rinsing with one of three irrigation solutions: distilled water, water from a municipal water source, or a mixture of distilled water and Scope mouthwash concentrate. Under the conditions of this study, the use of diluted Scope mouthwash did provide slightly lower enamel/composite, and dentin/composite bond strengths. However, the differences were not statistically significant when compared with using the distilled water control or untreated municipal water. **The results demonstrate that diluted Scope mouthwash may be used in a continuous mode as a waterline disinfectant during bonding procedures. However, further study is required to answer questions dealing with possible long-term effects on the restoration, and possible restorative material specificity.**

PATIENTS CARE ABOUT INFECTION CONTROL

Dental clinical attire and infection-control procedures. Patient attitudes. Shulman ER, Brehm WT. J Am Dent Assoc 2001;132;508-16.

Today s dental infection control procedures differ considerably from those of 25 years ago. Many dental infection control procedures are based on science and are required by law. Dentists need to have an understanding of patient preferences regarding these procedures. The authors of this study surveyed adults in military and civilian practices about infection control procedures and clinical attire to determine if their attitudes had changed with the changes in the procedures and attire over the last two decades. Results showed that 52% and 53% of military respondents preferred nametags and patient safety glasses, respectively. Most respondents had no preference regarding the clothing worn by dentists or the use of head covers. A total of 43%, and 74% of respondents preferred that dentists wear safety glasses and masks during examinations. Approximately 54% and 77% preferred their use during actual treatment. Respondents preferred the use of plastic barriers, and 63% said it made them feel confident that proper infection control procedures were being followed. More than half of the respondents said they would be concerned if barriers were not used. **Military and civilian respondents had definite and similar perceptions of infection control procedures. This study can be used by dental clinics to review their infection control procedures and patient preferences to improve customer satisfaction.**

RESOLUTION IS IN THE EYE OF THE BEHOLDER

Diagnostic utility of thermal printed panographs compared with corresponding computer monitor images. Guerrant GH, Moore WS, Murchison DF. Gen Dent 2001;49:190-196.

Panoramic radiography has been used in dentistry since the 1950s, providing an abundance of information, and aiding in diagnosis and treatment planning. Recently, digital panography has been introduced where images are displayed on a computer monitor screen. These images can then be printed for archiving. This study compared two modes of viewing digital panoramic radiographs: thermal print images and computer monitor images. Their relative diagnostic potentials were specifically assessed. Evaluators subjectively and qualitatively scored the diagnostic utility of each image by reviewing 13 specified anatomic landmarks. Results showed statistically significant differences between quality ratings for the two viewing formats. Image quality varied depending on the anatomic site being evaluated. **Monitor images were rated higher than corresponding thermal prints for 12 of the 13 anatomic landmarks, but both formats provided acceptable quality for the majority of the landmarks. Thermal prints were found to be lacking when viewing the dentinoenamel junction.**

WHAT A PAIN IN THE #$%!&*

Musculoskeletal pain: prevalence, prevention, and differences among dental office personnel. Lalumandier JA, McPhee SD, Parrot CB, Vendemia M. Gen Dent 2001;49:160-166.

The dental literature contains many studies documenting musculoskeletal pain in general dentists and hygienists, but there is insufficient information concerning the effects on dental specialists and other

auxiliaries. The purpose of this study was to determine the prevalence and compare the frequency of musculoskeletal pain among dentists, specialists, and auxiliaries. Occupational data were collected via surveys and respondents were asked to indicate which body parts frequently gave them pain or soreness. The survey results indicated that dental personnel experience pain in different areas. General dentists, comprehensive dentists, orthodontists, pediatric dentists, and prosthodontists had exactly the same ranking of musculoskeletal pain location: back, neck, shoulders, legs, and arms. Oral surgeons complaints were similar, but the ordering of pain areas was different: back, shoulders, legs, neck, and arms. Endodontists complained mostly of back pain, but the order was also different: back, shoulders, neck, arms, and legs. Periodontists complained of neck, back, shoulders, arms, and leg pain. Dental assistants complained of pain in similar areas as general dentists and most specialists, but dental hygienists and dental therapy assistants complained mainly of neck pain, followed by pain in the shoulders, back, arms, and legs. **The authors suggested that dental professionals can reduce the risk of musculoskeletal injuries/pain by using proper body posture/patient positioning during dental procedures, incorporating regular rest periods, maintaining good general health, and performing exercises for the affected body areas.**

ANOTHER BLOW TO BULK CURING OF PACKABLE COMPOSITES

The suitability of packable resin-based composites for posterior restorations. Manhart J, Chen HY, Hickel R. J Am Dent Assoc 2001;132:639-645.

Packable resin composites are resin restorative materials that are claimed by their manufacturers to be easier to place and more advantageous to use than standard composites for the restoration of posterior teeth. Some of the manufacturers, in fact, claim that these products can be used as amalgam substitutes and can be bulk cured in thicknesses of up to 5 mm. Until recently, few articles have appeared in the literature assessing the laboratory performance of these products. In DIS 62, an article was reviewed that concluded that the physical and mechanical properties of these materials were similar to those of some nonpackable resins. The current study tested three packable composites (ALERT, Jeneric/Pentron; Solitaire, Hereaus Kulzer; SureFil, Dentsply/Caulk), a standard hybrid (Tetric Ceram, Ivoclar/Vivadent), and an ion-releasing composite (Ariston pHc, Ivoclar Vivadent). The properties measured were stiffness, hardness, and depth of cure. Results indicated that there were statistically significant differences among the materials for all three properties. Solitaire was the softest and least rigid, while ALERT was the hardest and most rigid. Ariston had the shallowest depth of cure (2.2 mm) and ALERT had the deepest (3.5 mm). **The authors concluded that clinicians need to select packable composites carefully for posterior use because not all are suitable for load-bearing situations. Also, bulk curing of these materials in deep cavities is not recommended.**

DENTISTS AND THEIR RATES OF SUICIDE

Stress-related suicide by dentists and other health care workers. Fact or folklore. Alexander RE. J Am Dent Assoc 2001;132:786-794.

It has been an accepted as fact that dentists and other health care professionals are more prone to suicide than the general public. Often, this fact is accepted with little or no actual evidence. This article examines the relationship between suicide and professional stress and examines how the profession is dealing with stress. In an attempt to verify or refute the generally-held belief that suicide rates are higher among dentists and other health care workers, the author examined the contemporary literature dealing with stress and stress-related suicide. Also, he surveyed 54 accredited US dental schools to find out what programs, if any, were in place to help students manage stress and educate them about suicide among professionals. The school survey found that 90 percent of the schools offered lectures to predoctoral students on professional stress and 80 percent reported having structured stress counseling programs available to students. **As a result of his review of the literature, the author concluded that while evidence indicates that dentists are subject to stress, depression, and suicidal ideation, no conclusive evidence exists that dentists, as a group, are more prone to suicide than any other matched group in the general population.**

MAXIMIZING THE SUCCESS OF YOUR POSTERIOR RESIN COMPOSITE RESTORATIONS

Posterior resin-based composite restorations: Clinical recommendations for optimal success. Ritter AV. J Esthet Restor Dent 2001;13:88-99.

Esthetic restorations, including resin composites, continue to be a popular choice for restoring posterior teeth. This popularity is due, in part, to the publics concerns about the safety of dental amalgam and its possible effects on the environment. A more significant reason for the use of esthetic restorations appears to be the great emphasis that our culture places on appearance. The purpose of this article was to describe, illustrate, and discuss important clinical aspects of posterior resin composite technique. The article covers criteria for proper case selection, tooth preparation, application of the dentin bonding agent, selection of the type of restorative resin, and placement/polymerization methods. Three clinical cases are presented and discussed, each with numerous, high-quality color pictures. This is a well-written article that describes how clinicians can maximize the clinical success of their posterior resin composite

restorations.

ETCHING UNPREPARED ENAMEL WHEN USING SELF-ETCHING PRIMERS

Aggressiveness of contemporary self-etching adhesives. Part II: etching effects on unground enamel. Pashley DH, Tay FR. Dent Mater 2001;17:430-444.

One of the most recent developments in dentin bonding has been the self-etching primer products. These contain solutions that both etch and prime tooth structure in one step. Their main advantage is that they simplify (and usually shorten) the bonding procedure. Although these products have been shown to bond strongly to dentin, their ability to bond to enamel has not been thoroughly investigated. To complicate matters, most of them come with instructions that call for separate phosphoric acid etching of enamel if it has not been prepared (i.e., roughened, ground) before bonding is done. The purpose of this study was to evaluate the tensile bond strengths and ultrastructural features of several self-etching adhesives on unground enamel. Three products (Clearfil Mega Bond [sold by Kuraray as Clearfil SE Bond in the United States]; Prime & Bond NT with No Rinse Conditioner, Dentsply/Caulk; Prompt L-Pop, 3M ESPE) were applied to unground enamel as recommended by their manufacturers. A control group was bonded using a 32% phosphoric acid etchant and All-Bond 2 (Bisco). Microtensile bond strengths were measured and analyzed using appropriate statistical methods. For ultrastructual analysis of the products effects on enamel, scanning and transmission electron microscopy were used. Results indicated that mean bond strengths of the three self-etching primer products were significantly lower than that of the control group, but not different from each other. Ultrastructurally, the self-etching primers varied in their degree of aggressiveness in etching enamel, with Clearfil Mega Bond being the least aggressive and Prompt L-Pop being the most aggressive. **The authors concluded that the tested self-etching primer products produced low tensile bond strengths to unground enamel. Their bond strengths were unrelated to their degree of aggressiveness in etching enamel.**

DIS Comment: It appears that at least for these three self-etching primer products, unprepared enamel should be separately etched with a standard (i.e., 30% to 40%) concentration phosphoric acid etchant. This will add from 30 to 40 seconds to the bonding procedure, making these products a bit less attractive and simplified , but at least then a strong bond will result.

LONG-TERM CLINICAL PERFORMANCE OF AMALGAMBOND PLUS

The performance of bonded vs. pin-retained complex amalgam restorations. A five-year clinical evaluation. Summitt JB, Burgess JO, Berry TG, Robbins JW, Osborne JW, Haveman CW. J Am Dent Assoc 2001;132:923-931.

Amalgam bonding has been performed by clinicians for over ten years, and many laboratory studies have been done to assess its ability to bond amalgam to extracted teeth. Few long-term clinical studies have been published that have evaluated how well amalgam bonding retains complex (i.e., those replacing at least one cusp) amalgam restorations. This study compared the clinical performance of complex amalgam restorations retained using either Amalgambond Plus bonding agent (Parkell) or threaded pins. The authors placed 60 amalgam restorations (32 bonded and 28 pin-retained) and evaluated five measures of clinical performance over a five-year period. Marginal discoloration, marginal adaptation, and secondary caries were graded using modified Cvar/Ryge criteria. Tooth vitality was evaluated thermally and with a pulp tester, while sensitivity was tested thermally. The results were analyzed using appropriate statistical methods. The study found that by the five-year point, nine of the 40 teeth available for evaluation had failed: seven were pin-retained and two were bonded. No significant difference was found between the bonded and pin-retained groups for any of the five criteria evaluated. **The authors concluded that using a 4-META-based bonding resin is a satisfactory method of retaining large, cusp-replacing amalgam restorations.**

DIS Comment: This is a very important study of amalgam bonding because it is one of the few clinical studies that has evaluated the performance of bonded amalgams over a long-term period. Studies like these are vitally important to the practice of dentistry because they tells us how materials perform where the rubber meets the road, that is, in the patients mouth. If a procedure doesnt work or a product cant perform successfully where it needs to, it shouldnt be used.

DO WE HAVE TO SEAL RESIN-MODIFIED GLASS-IONOMER RESTORATIVE MATERIALS?

Effectiveness of surface protection of resin modified glass ionomer cements evaluated spectrophotometrically. Cefaly DFG, Seabra BGM, Tapety CMC, Taga EM, Valera F, Navarro MFL. Oper Dent 2001;26:401-405.

It is well known that glass-ionomer cements need to be coated with a protective glaze after placement. This prevents them from moisture contamination and desiccation, which can have adverse effects on their solubility and translucency. However, there has been controversy regarding the need to use a protective sealant on exposed surfaces of resin-modified glass-ionomer cements (RMGICs) such as Fuji II LC Improved (GC America), Vitremer (3M ESPE), and Photac-Fil Quick (3M ESPE). This study

evaluated the effectiveness of four sealers for RMGICs using a spectrophotometric method measuring dye uptake. Ninety discs (3 mm in diameter and 1 mm in height) were made of Fuji II LC, Vitremer, and Photac-Fil. They were divided into 6 groups and sealed with either a proprietary glaze (Fuji Coat LC from GC America, Finishing Gloss from 3M ESPE, Ketac Glaze from 3M ESPE), nail varnish, flowable resin (Flow It! from Jeneric/Pentron), or a glaze (Taub Glaze from George Taub Products). The two remaining groups served as controls. The discs were immersed in a 0.1% methylene blue solution for 24 hours, removed, and rinsed. They were then processed to permit spectrophotometric analysis of the amount of dye they had absorbed. The results indicated that all surface sealants were effective. For Fuji II LC and Vitremer, there were no differences between sealants. For Photac-Fil, nail varnish was more effective than the proprietary glaze (i.e., Ketac Glaze). **The authors concluded that RMGICS need surface protection and that the four sealants used in this study were effective at providing that protection.**

DIS Comment: Most of us are aware that glass-ionomer restorative materials like Ketac-Fil (3M ESPE) and Fuji II (GC America) need to be protected from moisture contamination and desiccation. To do this, we use a sealant, usually a light-activated bonding resin, over their exposed surfaces. Although there is evidence in the literature that RMGICs can also benefit from being sealed, manufacturers of these products often do not recommend the use of a sealant or make it optional. This study adds to the existing evidence that RMGICs should be sealed.

GENERAL DENTISTRY

63-09 PrepStart Air Abrasion Unit (Project 00-27)

The PrepStart (previously known as the PrepStar) is a tabletop air abrasion unit said to offer the performance and control of larger air abrasion units at a lower cost. The PrepStart is powered by the dental unit air supply (80 psi recommended, 60 psi minimally required) via the same type of port as that used by the Danville Microetcher. It is said to offer 3-stage air filtration, adjustable abrasive flow, adjustable pressure control, and can use either 27- or 50-micron aluminum oxide powder. If higher cutting pressure is desired, Danville Engineering offers the optional PowerPlus Air Booster that is purported to boost dental unit air pressure up to 135 psi without the requirement for an additional compressor. The PowerPlus Air Booster is said to increase air pressure by using an internal, air-powered compressor that does not require electricity.

Manufacturer:
Danville Engineering, Inc.
2021 Omega Road
San Ramon, CA 94583-1203
(800) 827-7940
(925) 838-7940
(925) 838-0944 FAX
www.daneng.com

Suggested Retail Price:
$1995 PrepStart Air Abrasion System
- PrepStart Air Abrasion Unit
- 2 nozzles
- 2 handpieces
- 1 container 50-micron alumina (one pound)
- 1 container 27-micron alumina (one pound)
- owner s manual
- 2 pairs of safety glasses
- training video

$795 PowerPlus Air Booster

Government Price: Currently, no government prices have been established.

ADVANTAGES:
+ As efficient as compressor-powered air abrasion units.
+ Considerably less expensive than compressor-powered air abrasion units.
+ Compact in size.
+ Easy to connect/disconnect and transport within dental clinics.
+ Intelligent layout and unit design.
+ Easy to operate without an excessive learning curve.
+ Optional PowerPlus Air Booster increases air pressure and unit efficiency without requiring electrical power.
+ Manufacturer s instructions are complete and easy to understand.
+ Can be adequately barrier protected.
+ Compatible with both 27- and 50-micron alumina powder.
+ One-year warranty.

DISADVANTAGES:
- Anesthesia is still required for preparations involving deeper dentin.
- As with all air abrasion units, alumina powder overspray control is problematic when using clinic high volume evacuation alone.
- Alumina powder must be purchased from manufacturer to maintain warranty.

SUMMARY AND CONCLUSIONS:
The PrepStart is a tabletop air abrasion unit that derives its power from the dental unit compressed air supply. The PowerPlus Air Booster is an auxiliary boosting unit that increases dental unit air pressure, which increases the PrepStart s efficiency. Clinical evaluators were impressed with the PrepStart s performance, noting that it was just as efficient as compressor-powered air abrasion units. It is also compact in size, easily transported, functions well without clogging, and does not have a steep learning curve. The PrepStart is considerably less expensive than compressor-powered air abrasion units. Due to its efficiency, ease of function, and cost, the **PrepStart Air Abrasion System** is rated **Recommended** for use by the federal dental services.

(Lt Col Roberts)

63-10 Nexus 2 Universal Luting System (Project 01-06)

Nexus 2 is a two-paste, dual-cured cement that is used in conjunction with OptiBond Solo Plus dentin bonding agent for luting indirect restorations. Nexus 2 is packaged in the familiar plastic tackle-box made popular by SDS/Kerr. Four syringes of base paste are provided in shades Clear, White, White Opaque, and Yellow. A fifth shade (Brown) is available separately. Also included are one syringe each of high- and low-viscosity catalyst pastes and four shades of water-soluble, try-in paste. OptiBond Solo Plus bonding agent, phosphoric acid etchant, and silane solution are provided for pre-luting treatment of the restoration and prepared tooth.

Nexus 2 is recommended for the luting of: porcelain and resin veneers, inlays, onlays, and crowns; porcelain-fused-to-metal crowns and bridges; and posts. In addition to a detailed, multi-language, written instruction booklet, four graphics-containing summary instruction cards are provided.

Manufacturer:
Sybron Dental Specialties/Kerr
1717 W. Collins Avenue
Orange, CA 92867-9880
(800) 537-7123
(714) 516-7400
(714) 516-7633 FAX
www.kerrdental.com

Suggested Retail Price:
$174.00 Nexus 2 Kit (product number 29708)
- -four 3-g syringes of base paste (shades Clear, White, White Opaque, Yellow)
- -two 3-g syringes of catalyst paste (low and high viscosity)
- -four 3-g syringes of try-in paste (shades Clear, White, White Opaque, Yellow)
- -one 5-mL bottle of OptiBond Solo Plus
- -one 3-g syringe of Kerr Gel Etchant
- -one 5-mL bottle of Silane Primer
- -accessories

Government Price:
$135.14 Nexus 2 Kit (product number and contents as listed above)

ADVANTAGES:
+ Has two viscosities for user preference.
+ Provided with try-in pastes.
+ Supplied with silane solution and a bonding agent that is fast, easy to use, and effective.
+ Acceptably-thin film thickness.
+ Working time is long enough that users can mix and use cement without rushing.
+ Setting time is relatively short, which minimizes post-cementation chair time.
+ No post-treatment sensitivity reported.
+ Adequately radiopaque for easy detection on radiographs.
+ Users found the cements four shades adequate for most clinical cases they treated.
+ Excess marginal cement was easy to remove.
+ Try-in pastes were beneficial in checking shade prior to luting.
+ Expiration dates and lot numbers are provided for all items in kit.
+ Recommended storage conditions listed on box.
+ Written instructions are detailed and describe product use very well.
+ Comes with excellent graphics-containing instruction cards.

+ Provided with color-coded applicator tips for silane and bonding agent.
+ Packaged in compact, portable tackle box.

DISADVANTAGES:
- Fifth available shade must be purchased separately.
- Material Safety Data Sheet (MSDS) is not included in kit.

SUMMARY AND CONCLUSIONS:
Nexus 2 Universal Luting System was very well received by the clinical evaluators. They found the instructions complete and the product user-friendly. Importantly, it contained all the components necessary for use. Its compact packaging and OptiBond Solo Plus bonding agent were rated highly by users. Nexus 2 performed well in the laboratory: it had an acceptably-thin film thickness, appropriate working and setting times, and was adequately radiopaque. Esthetically, the cement performed well because of its four shades and corresponding try-in pastes. Because of its compact packaging, ease of use, inclusiveness, and esthetics, **Nexus 2 Universal Luting System** is rated **Recommended** for use by the federal dental services.

(Col Charlton)

63-11 Cavitron Select Ultrasonic Scaler (Project 00-26)

The Cavitron Select (CS) is a portable, ultrasonic scaling unit manufactured by Dentsply. An innovative feature of the CS is its self-contained water reservoir, which has a 450-mL capacity. Fluid from the reservoir is sent to the scaler tip by an internal pump mechanism. Ultrasonic scalers are reported to have an optimum frequency range of 18,000 to 32,000 kHz (cycles per second); the CS produces 25,000 kHz. The unit is shipped with the following items: ultrasonic scaler, reservoir bottle, foot control, handpiece attachment, water line, AC power cord, universal power supply, and instruction manual.

Manufacturer:
Dentsply Professional Division
1301 Smile Way
York, PA 17404
(800) 989-8826 (ext 8632)
(800) 278-4344 FAX
www.dentsply.com

Suggested Retail Price:
$1,573.95 Cavitron Select with reservoir and pump (part number 90113)

Government Price:
$979.22 Cavitron Select with reservoir and pump (part number 90113)

ADVANTAGES:
+ Efficient in removing calculus at all power settings with minimal soft tissue damage.
+ Self-contained water reservoir eliminates the need for a dedicated water source for irrigation.
+ Manufacturer s Instructions are easy to read and complete.
+ Waterline disinfection protocol is clearly stated and follows USAF recommendations.
+ No reported patient sensitivity.
+ Reservoir can be autoclaved.
+ Compatible with different irrigation solutions.
+ Compact, esthetically-pleasing unit.
+ Logical placement of operational controls.
+ Can be connected to a dedicated dental unit water supply, if desired.
+ Lightweight and portable.
+ Easy to clean.
+ Smooth finish facilitates asepsis.
+ Full 2-year warranty.

DISADVANTAGES:
- Water control switch on handpiece is difficult to locate.
- Weight of unit does not resist dislodgment from stand.
- Noise level of integral pump may be annoying.
- Water reservoir may be inadequate for lengthy patient appointments.

SUMMARY AND CONCLUSION:
The Dentsply Cavitron Select (CS) is an innovative ultrasonic scaling unit. Its ability to use irrigant from a self-contained reservoir or from the dental unit water supply enables the unit to be used in the dental treatment room, operating room, or in the field. All clinical users felt the unit was effective at removing calculus with minimal soft tissue trauma. The overall rating for the CS from all clinical evaluators was either Good or Excellent. The main disadvantages of the CS are its relatively small water reservoir and somewhat objectionable noise level. The **Cavitron Select** is rated **Acceptable** for use by the federal dental services.

(MSgt Belde)

63-12 Micronew Reinforced Microfill Composite (Project 01-14)

According to its manufacturer (Bisco), Micronew is an esthetic, light-activated, reinforced microfill that has a higher viscosity than traditional microfill resin composites. Like conventional microfills, Micronew has predominately submicron filler particles (around 0.05 microns). It differs, however, in having a small percentage of larger particles which purportedly gives it additional strength. The reinforcing filler allows Micronew to be filled to 69% by weight, which is considerable higher than conventional microfills. Bisco claims that Micronew has the esthetics and polishability of a traditional microfill combined with increased strength that allows it to be used for most classes of direct restorations. The product comes in four translucent (A1, A2, A3.5, B1), three incisal (Light Gray, Medium Gray, Frost), and one opaque (BO) shades. Among other uses, Micronew is recommended for Class III, IV, and V restorations; diastema closures; direct veneers; and porcelain/composite repairs. Instructions call for placing the material in 1- to 2-mm increments with a 20-second curing time.

Manufacturer:
Bisco, Inc.
1100 West Irving Park Rd.
Schaumburg, IL 60193
(800) 247-3368
(847) 534-6000
(800) 959-9550 FAX
www.bisco.com

Suggested Retail Price:
$290.00 Micronew Reinforced Microfil Composite Complete Kit (item no. H-75000K) contains:
-eight 2.5-g syringes, 1 each of shades TRANSLUCENT A1, A2, A3.5, B1, INCISAL Frost, Light Gray, Medium Gray, and OPAQUE BO
-two 1.5-g syringes of Fortify Plus
-one 7-g bottle of 32% Uni-Etch
-accessories

Government Price:
$246.50 Micronew Reinforced Microfil Composite Complete Kit (item number and contents as listed above)

ADVANTAGES:
+ Clinical evaluators praised the product for its excellent polishability and overall esthetics.
+ Significantly harder than four other microfills tested by DIS.
+ Only requires a 20-second light exposure for adequate curing.
+ Material Safety Data Sheet (MSDS) is provided with the product.
+ Comes with syringes of Fortify Plus, a surface sealant which one study found reduces composite surface wear.
+ All components have lot number and expiration date printed on them.

DISADVANTAGES:
- Very tacky; sticks to instruments.
- Users expressed a desire for a broader range of shades.
- Diametral tensile strength was no greater than that measured for two other microfills.
- Not available in capsule form.
- No shade guide included.
- Not adequately radiopaque for radiographic detection.
- No dentin bonding agent is provided in kit.

SUMMARY AND CONCLUSIONS:
Micronew was not as highly rated by clinical evaluators as have been other microfill resin composites evaluated by DIS. It has a shorter curing time (i.e, 20 seconds) than many other resin composites, which reduces chair time. While significantly harder than the four other microfills tested by DIS (one of which is also a reinforced microfill [Heliomolar HB, Ivoclar Vivadent]), it was not stronger than traditional non-reinforced microfills. Important disadvantages include the products lack of a unit-dose capsule dispensing system, limited number of shades, and stickiness. Potential buyers should be aware that no bonding agent is provided in the kit, which is somewhat unusual for most currently-marketed composite resins. Micronew is neither the least nor the most expensive microfill resin composite on the market. Clearly, its main advantages are its excellent polishability and overall esthetics. Laboratory measurements of its polished surface confirmed the users observations regarding its smoothness. In general, the product performed adequately, but other microfills evaluated by DIS have been received more favorably by clinical evaluators. **Micronew Reinforced Microfill Composite** is rated **Acceptable** for use by the federal dental services.

(Col Charlton)

63-13 Original D Amalgam (Project 01-19)

Original D is a high-copper, admixed alloy containing spherical silver-copper eutectic particles dispersed within silver-tin lathe cut particles. Compositionally, Original D consists of silver (69.5%), tin (17.5%), copper (12.0%), and zinc (1.0%). Its mercury to alloy ratio is 50%. Because of its silver-copper eutectic particles, gamma two is eliminated from the alloy. The product was first evaluated by DIS in 1991 (Project 91-18) and received an Acceptable rating. Although its composition has not been changed since that time, Original D s manufacturer, the Wykle Company, reports that its capsule design has been improved. Specifically, the mercury is no longer delivered to the alloy powder using a pillow pack. Instead, the self-activating, recloseable capsule uses an innovative, two-piece, plastic pestle that has a collapsing compartment that delivers the mercury during trituration. Wykle claims that this has reduced the incidence of incomplete and poor mixing. Original D is available in 100- and 500-capsule lots in 1-, 2-, and 3-spill sizes. Three setting times are also available: Regular (5 minutes), Fast (4 minutes), and X-tra Fast (3 minutes). Only the Fast-Set and Regular-Set versions were evaluated by DIS.

Manufacturer:
Wykle Research, Inc.
2222 Hot Springs Road
Carson City, NV 89706
(800) 859-6641
(775) 887-7500
(775) 882-7952 FAX
wykledirect.netfirms.com/nav.html

Suggested Retail Prices:

Description	Item No.	National Stock Number (NSN)	Price
1 Spill, Regular Set, 100 capsules	61150-03	----------	$71.00
2 Spill, Regular Set, 100 capsules	61250-03	----------	$88.00
2 Spill, Fast Set, 100 capsules	61240-03	----------	$88.00
1 Spill, Regular Set, 500 capsules	61152-03	6520-01-341-8729	$305.00
2 Spill, Regular Set, 500 capsules	61252-03	6520-01-341-8728	$332.00
2 Spill, Fast Set, 500 capsules	61242-03	6520-01-341-8730	$332.00

Government Prices: Same as retail

ADVANTAGES:
+ Based on testing by a university laboratory, dimensional change, strength, and creep values all met specification requirements.
+ Capsules are self-activating.
+ Features an innovative mercury delivery system.
+ Is available in three spill sizes and three setting times.
+ Instructions are clear and concise.

+ Provided with Material Safety Data Sheet (MSDS).

DISADVANTAGES:
- Setting times and frequencies are not provided in instructions for some popular triturators.
- Users reported having to make trial mixes to determine proper triturator settings.
- Four of the seven evaluators reported an unusually large number of capsules with unmixed amalgam after trituration.
- Reported by users to require more force to condense than Dispersalloy and to be more difficult to carve.
- Some users may find the capsules difficult to open.

SUMMARY AND CONCLUSIONS:
Clinical evaluators were somewhat mixed in their opinions of Original D. Some users found the product s handling characteristics to be in keeping with other admixed alloys they had used. Others, however, reported problems including the need for initial trial mixes to determine the exact triturator settings to use with the amalgam. Even after determining the appropriate settings for their triturators, users experienced a number of nonhomogeneous mixes. The latter may have been due to mixing the material at a suboptimal frequency. It is important to mix Original D at the recommended, relatively-high frequency to ensure proper trituration. Laboratory data provided by an outside laboratory indicates that Original D s strength, creep value, and degree of dimensional change are well within the requirements of the applicable standard. Generally, Original D is more expensive than the admixed alloy Dispersalloy, however there are some spill-size/capsule-quantity combinations that are cheaper. A majority of the evaluators, however, felt that Original D required more force to condense and was more difficult to carve than Dispersalloy. DIS expects that users satisfaction with Original D will depend on their familiarity with their current admixed alloy and the degree to which they are satisfied with it. Five of the seven evaluators awarded Original D an overall rating of only Average or Fair. Most said they would not replace their clinic s current admixed amalgam with the product. **Original D** is rated **Acceptable** for use by the federal dental services.

(Col Charlton)

63-14 AXCS Dental Chair and AXCS Dental Unit Combination (Project 01-13)

The DentalEZ aXcs Dental Unit is an over-the-patient, chair-mounted dental unit that is compatible with the DentalEZ Model J and aXcs dental chairs. The control head is capable of supporting three air-driven handpieces and the provided autoclavable three-way syringe. The fiber-optic power unit supply is said to be able to support up to three fiber-optic handpieces. The control head has a hinged cover that allows easy access to the fiber-optic power supply as well as the control block for any needed maintenance. The control head also features a removable stainless-steel instrument tray on the top surface. The aXcs Dental Unit s side console houses a self-contained water system, plumbing quick connections, and external air and water outlet connectors for accessories. The unit that was evaluated was ordered with a moveable accessory tray instead of the optional cuspidor. The assistant s breakaway arm includes high-volume evacuation, saliva ejector, and a three-way air/water syringe. In order to facilitate cleaning of the horizontally-aligned filter, both high- and low-volume suction feature a rotary valve to shut off the vacuum. The control head has a sealed, programmable touch pad control for the dental chair; a foot control is also available. Chair control option combinations are limited to either two touch pads or a touch pad and a foot control for each DentalEZ operating system. The aXcs Dental Chair and Unit are said to have a durable, powder coating that provides both rounded corners and smooth surfaces to enhance cleaning. DentalEZ provides a three-year warranty covering the structures, controls, and electronics. The DentalEZ aXcs Chair and Unit are both UL and CE listed and are available in either 115-volt or 230-volt AC. DIS has previously evaluated the aXcs Dental Chair (Project # 98-10) and rated it Acceptable. The only other evaluation of the aXcs Dental Unit was in combination with the DentalEZ J Chair (Project #99-53). Unfortunately, this combination of the Dental Unit and Chair was rated Marginal due to stability problems and poor manufacturer support. This is the first DIS evaluation of the combination of the aXcs Dental Unit and the aXcs Dental Chair.

Manufacturer:
DentalEZ
Highway 31 South
Bay Minette, AL 36507
(866) 383-4636
(334) 937-0461 (FAX)
www.dentalez.com

Suggested Retail Price:

aXcs Chair with one control:	$5,810.00
aXcs Chair with two controls:	$6,070.00
aXcs Unit (CMU-B):	$5,660.00

Government Price:

aXcs Chair with one control:	$2,876.00
aXcs Chair with two controls:	$3,016.95
aXcs Unit (CMU-B):	$2,468.00

ADVANTAGES:

+ Less expensive than other units evaluated by DIS.
+ Smooth, rounded, aseptic design.
+ The stability of the dental unit and chair has improved compared to previously-evaluated combinations.
+ Customer service from DentalEZ has improved over previous evaluations.
+ Conversion of the dental chair and unit from right-hand to left-hand configuration is easily accomplished.
+ Durable, powder-coated finish.
+ Features individual handpiece drive-air and water adjustments.
+ Hinged panel allows easy access to control block for service.
+ Has a one-piece, quick-release, twist-lock coupler for connecting handpieces to their hoses.
+ Internal tubing is color-coded for ease of service
+ The side console has external air and water connections for use with accessory items.
+ Has a positive latch brake assembly for the control head arm.
+ Rotary valve on high evacuation suction allows easy control of function.
+ Easy-to-remove vacuum filter.
+ Three-year warranty on structures, controls and electronics.

DISADVANTAGES:

- Activation of fiber optics requires handpiece air to be on.
- Minor rough and sharp edges were found on the base frame of the dental chair.
- Restricted chair swivel may limit patient access in some situations.
- The cover of the side console was very difficult to replace.
- Schematic error was found in connector to dental light.
- No exploded parts diagram was provided for the dental chair.

SUMMARY AND CONCLUSIONS:

The DentalEZ aXcs Dental Chair and aXcs Dental Unit met the laboratory testing requirements of American Dental Association Specification #47, NFPA 99, and most of the Dental Chair Medical Procurement Item Description #2. The unit has esthetic, smooth lines and contours, and it functioned well during the clinical evaluation. The clinical evaluator found the unit easy to use in a pediatric dental practice and rated the unit Excellent. Right-hand to left-hand conversion of the dental unit is easily accomplished in approximately 15 minutes. The stability of this combination of dental chair and unit is much better than that of the aXcs Unit and J Chair combination. Also, DentalEZ customer service has improved considerable over time. The side console cover is difficult to replace and an exploded parts diagram should be provided for the aXcs Chair. The **aXcs Dental Chair and Unit** are rated **Acceptable** for use by the federal dental services.

(Mr LaForge)

63-15 Zap Dual Curing Light (Project 01-26)

The ZAP Dual Curing Light combines a standard halogen bulb plus Light Emitting Diode (LED) technology to polymerize visible light activated materials. Compared to standard halogen bulbs, LED technology uses semiconductors, in most cases gallium nitride, to activate the camphorquinones that initiate resin polymerization. The LEDs produce light of a more narrow spectral range with less heat than that produced by halogen bulbs. The ZAP Dual Curing Light s LEDs activate first for 5 seconds and then both the LEDs and the halogen bulb produce light for either 6 or 12 seconds, depending on the setting chosen. This results in a total exposure of 11 or 17 seconds, respectively. The low-intensity initial LED exposure is used to take advantage of the soft-cure method of resin polymerization, which purportedly reduces polymerization stress and marginal gap formation. The combination LED/halogen exposure then completes the polymerization. The ZAP Dual Curing Light is an attractive unit consisting of a smooth cylindrical-shaped handpiece attached via a 6½-foot flexible cord to the power unit. The handpiece

contains the 75-watt quartz-halogen bulb and the 12-LED array. Timer controls are positioned on the handpiece and the light is directed via an 8-mm-diameter autoclavable curing tip. The output in the wavelength range of 450 to 490 nm is purported to be 40 mW/cm^2 for the LED and 350 mW/cm^2 for the combination LED and halogen. The cooling fan runs for five minutes regardless of the length of exposure or amount of heat generated by the halogen bulb. The unit is available in both 120V and 220V models and is CE certified. The handpiece is 7 inches long, 2 inches in diameter, and weighs 8 oz. The power unit is 8.5 inches long X 5 inches wide X 3 inches high and weighs 3.3 pounds.

Manufacturer:
CMS-Dental (Denmark)/Soft-Core Texas, Inc.
5424 Rufe Snow Drive, Suite 102
N. Richland Hills, TX 76180
(888) 462-8878
(888) 462-8879 FAX

Suggested Retail Price: $2495.00
Includes: ZAP Dual Curing Light and 8-mm-diameter curved fiberoptic curing tip

Government Price: $1500.00
Includes: same as above.

ADVANTAGES:
+ Offers soft start curing mode.
+ Has internal voltage regulation.
+ Curing tip swivels 360 degrees.
+ Autoclavable curing tip.
+ CE marked.
+ Passed DIS electrical safety testing.

DISADVANTAGES:
- Does not adequately cure resin composites using manufacturers recommended times.
- Required 85 seconds to polymerize the microfill resin composite tested.
- Handpiece becomes too hot to hold during normal use.
- More expensive than halogen curing lights.
- Cooling fan runs for five minutes regardless of the amount of heat generated.
- No protective light shield is provided.
- Only one size curing tip is available.

SUMMARY AND CONCLUSIONS:
The The ZAP Dual Curing Light incorporates proven halogen lamp technology with the latest Light Emitting Diode (LED) technology. The use of LED technology to initiate a soft start polymerization, followed by higher-intensity halogen irradiance is a valid concept, however the ZAP Dual Curing Light did not adequately polymerize the resin composites tested using the manufacturer s recommended exposure times. DIS found that twice the the recommended time was necessary to polymerize a hybrid resin composite and five times the recommended time was required to cure a microfill resin composite. The cooling fan was inadequate to sufficiently cool the handpiece; as a result, the handpiece became too hot to hold after only only minimal use. In addition, only one size curing tip is available, and no light shield is provided. Among its positive features, the light has an internal voltage regulator, an autoclavable curing tip, and it does polymerize hybrid resin composite in about the same amount of time as standard halogen-based curing lights. The units disadvantages, however, far outweighed its advantages. The **ZAP Dual Curing Light** is rated **Unacceptable** for use by the federal dental services.

(Col Leonard)

63-16 All-Dri Flat Pad (Project 00-49)

The All-Dri Flat Pad (ADP) is a small (½ inch x 2 inch), flat, cotton pad that is advertised as a replacement for cotton rolls for most dental procedures. It is said to be able to be folded into different shapes for ease of placement and is purported to be able to absorb three times its weight in moisture.

Manufacturer:
AllPro, Inc.
6930 W. 116th Avenue #10

Broomfield, CO 80038
(800) 243-2285
(303) 466-8911
(303) 466-8965 FAX

Suggested Retail Price:
$6.45 All-Dr Flat Pads (Box of 300) (part no. 500)

Government Price:
Same as retail

ADVANTAGES:
+ Acceptable to patients.
+ Easy to use.
+ Adaptable to limited-access areas.
+ Can be sterilized without degradation.

DISADVANTAGES:
- Viewed by evaluators as having no significant advantages compared to standard cotton rolls.
- More expensive than government stocklisted cotton rolls.

SUMMARY AND CONCLUSIONS:
The All-Dri Flat Pad is a flat cotton pad designed to be used in place of a typical cotton roll. Clinical users appreciated the ADP s small size, ease of placement, and its ability to adapt to areas of limited clinical access. Patients responded favorably to the ADP as compared to cotton roll isolation and the it appeared to survive autoclaving without visible degradation. However, clinicians felt that the ADP offered no real advantage over cotton roll for retraction of tissue or fluid absorption. Its cost is 4 times that of a cotton roll. The **All-Dri Flat Pad** is rated **Acceptable** for use by federal dental services.

(MSgt Belde)

63-17 Acucam Concept IV (Project 00-39)

The Acucam Concept IV is a video camera system for taking intraoral and extraoral images. The system consists of a handpiece that is connected to a universal docking station via a flexible monocoil cable. The handpiece has an integrated high-resolution digital signal processor, with a 62-degree field of view, 97.5-degree direction of view, and adjustable focus modes having a focal range of 1 millimeter to infinity. The adjustable focus modes provide extraoral, wide-angle, and close-up viewing. The universal docking station (dimensions-10" W x 12" L x 2.52" H) consists of an operator control panel with touch pads that perform all functions (illumination, image capture, image storage, image manipulation, image selection, and printing). For convenience, key functions on the control panel (capture and memory) are replicated on a footswitch. The docking station also contains a freeze frame board that holds up to four full-size images and one split-four image. The system can be configured as a stand-alone system or networked between multiple operatories, and can be integrated into video or digital format. The manufacturer also provides disposable, single-use, optically-transparent plastic sheaths for the handpiece to minimize the risk of cross-contamination.

Manufacturer:
Dentsply Gendex
901 West Oakton St.
Des Plaines, IL 60018
(800) 800-2888
(847) 678-4000
(847) 640-4891 FAX
www.gendexxray.com

Suggested Retail Price:
$5,485.00 Acucam Concept IV includes:
- -camera/handpiece
- -universal docking station
- -power cord
- -accessory kit
- -disposable sheaths

Government Price:
$3,565.25 Same as above

ADVANTAGES:
+ Produces instantaneous, high-resolution images.
+ Provided sharp image clarity.
+ Produced natural color quality of oral cavity.
+ Functions as an excellent patient education tool.
+ Aids in patient communication when discussing treatment plans.
+ Provides excellent documentation of pre-op/post-op images showing treatment results.
+ Touch pad controls are easy to use.
+ Handpiece is ergonomically designed.
+ Small, lightweight compact handpiece allowed for total access to oral cavity.
+ Disposable sheaths facilitate infection control.

DISADVANTAGES:
- System is bulky and difficult to maneuver if it is placed on a cart.

SUMMARY AND CONCLUSIONS:
The Acucam Concept IV provides high-quality intraoral and extraoral images using a lightweight handpiece with a small distal end, and a wide angle of view for total intraoral access. The depth of field and focusing modes provide versatility, and the control panel on the docking station has easy-to-use touch pad icons for capturing, viewing, manipulating, and storing images. The disposable barriers enhance infection control. The only drawback noted by evaluators was the lack of maneuverability if the system is used with a cart in the operatory. The **Acucam Concept IV** is rated **Acceptable** for use by the federal dental services.

(Col Bartoloni)

63-18 Expa-syl Temporary Gingival Retraction System (Project 01-11)

Expa-syl is a noncord gingival retraction product recently marketed by the SDS/Kerr Company. It consists of a green-colored paste provided in glass cartridges similar in size and shape to anesthetic cartridges. A metal dispenser gun is used to express the paste through a disposable metal dispensing tip into the gingival sulcus prior to impression making or prosthesis cementation. The paste is left in place for one to two minutes and then removed by rinsing. SDS/Kerr claims that hemostasis is produced by the paste s aluminum chloride while tissue retraction is achieved by its semi-rigid consistency. One purported advantage of Expa-syl over cord is that since it is placed with little or no pressure, damage to the epithelial attachment is minimized. Also, the procedure is said to be faster than using cord.

Manufacturer:
Sybron Dental Specialties/Kerr Corporation
1717 W. Collins Avenue
Orange, CA 92867-9880
(800) 537-7123
(714) 516-7400
(714) 516-7633 FAX
www.kerrdental.com

Suggested Retail Price:
$464.00 Expa-syl Intro Kit (item number 31175) contains:
-twenty 1-g capsules of retraction paste
-application gun
-40 applicator tips

Government Price:
$308.75 Expa-syl Intro Kit (item number and contents as listed above)

ADVANTAGES:
+ Effectively achieves hemostasis.
+ Retracts gingival tissues effectively when used in appropriate cases.
+ Evaluators reported technique was less traumatic to tissues than cord packing.
+ Faster to use than traditional cord method of retraction.
+ Color of paste makes it easy to see during use.

+ Is easy to remove material from sulcus by rinsing.
+ Applicator gun is extremely well made.
+ Disposable dispenser tips can be bent for improved intraoral access.
+ Comes with videotape and well-illustrated instruction manual.
+ Paste cartridges have lot number and expiration date on them.

DISADVANTAGES:
- Expensive.
- Is effective only under specific, limited conditions.
- The paste s thickness made it difficult for some evaluators to express it into the sulcus.
- Disposable metal dispenser tips are too large, making it difficult to express Expa-syl into the interproximal sulcus.
- Instructions describing dispenser gun use are incorrect.
- Product box is much larger than it needs to be.
- Not shipped with Material Safety Data Sheet (MSDS).

SUMMARY AND CONCLUSIONS:
DIS has rarely evaluated a product whose performance was so sensitive to placement technique and case selection. Expa-syl effectively produced hemostasis and was reported to produce adequate gingival retraction when the sulcular tissue was generous (i.e, the sulcus was of sufficient depth) and flexible. The most important requirement for it to function effectively, however, is that the tissue be absolutely dry during placement. Expa-syl s main advantages are that it takes less time to use and is less traumatic to the tissues than traditional retraction cord. The product is quite expensive, however, which makes it hard to justify given its limited clinical applications. The **Expa-syl Temporary Gingival Retraction System** is rated **Marginal** for use by the federal dental services.

(Col Charlton)

63-19 Palfique Estelite Resin Composite (Project 01-20)

According to its manufacturer, Palfique Estelite is an esthetic, radiopaque, light-cured resin restorative designed for use in direct anterior and selected posterior restorations where esthetics is of primary concern. J. Morita specifically recommends it for Class I, V, and small Class II restorations in the posterior dentition as well as restorations of all surfaces in the anterior dentition. The company further claims that it is the world s first resin composite filled with spherically-shaped particles. This is purported to result in greater polishability in less time. Also claimed as advantages are minimal color change during polymerization, chameleon-like shade matching, and a high level of radiopacity.

Information from J. Morita notes that Estelite is a filled 71% by volume (82% by weight) with patented submicron (0.2-micron) silica-zirconia spherical particles. Based on percentage filler loading and average filler particle size, Estelite is best classified as a microhybrid. It is available in a total of 14 shades (which includes incisal, cervical, and two opaque shades), although only four (A1, A2, A3, A3.5) are included in the syringe kit version evaluated by DIS. In addition to the syringe package version, Estelite is available in pre-loaded tips (i.e., single-use capsules).

Manufacturer:
J. Morita USA, Inc.
9 Mason
Irvine, CA 92618
(888) 566-7482
(949) 581-9600
(949) 465-1095 FAX
www.jmoritausa.com

Suggested Retail Price:
$162.00 Palfique Estelite Paste Syringe Set (item no. 22-14400) contains:
-four 3-g syringes, 1 each of shades A1, A2, A3, and A3.5

Government Price:
$105.30 Palfique Estelite Paste Syringe Set (contents and item number as listed above)

ADVANTAGES:
+ Exhibits a pronounced chameleon-like effect that facilitates shade matching.
+ Evaluators were highly impressed by its fine polishability and excellent overall esthetics.

+ DIS laboratory testing confirmed that the product is as highly polishable as microfills.
+ Good diametral tensile strength; comparable to that of other hybrids tested and stronger than microfills.
+ Available in a broad range of shades.
+ Syringes are clearly labeled with shade, lot number, and expiration date.
+ Recommended storage conditions are listed on box.
+ Material Safety Data Sheet (MSDS) is provided in kit.

DISADVANTAGES:
- Not adequately radiopaque for radiographic detection.
- Most evaluators found it somewhat sticky and difficult to sculpt.
- Syringe kit contains only four shades of resin; no bonding agent or shade guide is included.
- Not as hard as some hybrid composites tested by DIS.
- Instructions do not specify the maximum recommended thickness that can be placed prior to light activation.

SUMMARY AND CONCLUSIONS:
Palfique Estelite s handling characteristics were rated as comparable, overall, to those of other hybrid resin composites evaluated by DIS. The syringe version of the product is spartan: no dentin bonding agent or shade guide is provided and only four shades of the product are supplied. Users should be aware that Estelite is not adequately radiopaque as defined by published scientific literature or by the pertinent international standard. It should, therefore, be used with caution in the posterior dentition where adequate radiopacity is especially important for differentiating between tooth structure and the restorative material. The written instructions are deficient in not listing the maximum thickness of Estelite that can be placed prior to light activation. This is the first time DIS has encountered this deficiency in evaluating a resin composite. Estelite is mid-range in its cost, compared to many currently-available resin composites. Even with these shortcomings, this product clearly distinguishes itself by having a marked chameleon-like shade matching ability and high polishability that render it extremely esthetic. In short, Estelite is an excellent choice for cases such as large diastema closures and Class IVs where strong, fracture-resistant, esthetic restorations are necessary. **Palfique Estelite** is rated **Acceptable** for use by the federal dental services.

(Col Charlton)

63-20 Flexitime Impression Material (Project 01-12)

Flexitime is an addition silicone (i.e., poly[vinyl siloxane]) impression material which Heraeus Kulzer claims incorporates a new technology called ThermaSense. This causes the material to set rapidly (in 2½ minutes) after it is exposed to intraoral temperature. Clinicians can use as much or as little of its purported 2½-minute working time and be assured that it will set soon after placement in the mouth. The main claimed advantage, therefore, is the control the clinician has as to when the setting begins. It is also purported to have resistance to slumping, good flowability and wettability, and excellent dimensional stability.

The product is available in automix cartridges that are used in an automix gun dispenser. Flexitime comes in four viscosities: Easy Putty, Heavy Tray, Monophase, and Correct Flow (light body). Tray adhesive and mixing tips are included. The Heavy Tray Trial Kit, which was evaluated in this project, includes 2 cartridges each of Heavy Tray and Correct Flow material, mixing tips, an automix dispenser gun, and tray adhesive. A multi-language instruction sheet is provided along with a graphics-containing summary instruction card.

Manufacturer:
Heraeus Kulzer
4315 S. Lafayette Blvd.
South Bend, IN 46614-2517
(219) 291-0661
(800) 343-5336
(219) 291-7248 FAX
www.kulzer.com

Suggested Retail Price:
$82.00 Flexitime Heavy Tray Trial Kit (item number 34800) contains:
-two 50-mL Heavy Tray cartridges
-two 50-mL Correct Flow cartridges
-one 10-mL bottle of Universal Adhesive

-one Dispensing Gun 2
-assorted mixing tips

Government Price:
$45.11 Flexitime Heavy Tray Trial Kit (item number and contents as described above)

ADVANTAGES:
+ Working time is ample; users should not need to hurry during mixing and placement.
+ Setting time is short after material is placed in the mouth.
+ Meets the detail reproduction requirement of the applicable ISO standard; wash and tray materials should accurately capture fine detail.
+ Meets the requirement for dimensional stability by exhibiting minimal dimensional change over 24 hours.
+ Handling characteristics received consistent high ratings from users.
+ Colors facilitate reading critical areas of impression.
+ Acceptable odor and taste.
+ Excellent price.
+ Tray adhesive is included in kit.
+ Provided with an informative, graphics instruction card.
+ Lot number and expiration date are printed on each component.
+ Packaging version is available for use with Pentamix 2 electric mixing machine (3M ESPE).

DISADVANTAGES:
- Labels cover nearly all of cartridges making it difficult to see how much material remains.
- Only one gun dispenser is provided in kit.
- Flexitime cartridges do not fit in all other manufacturer s' dispenser guns.
- No Material Safety Data Sheet (MSDS) is provided with product.

SUMMARY AND CONCLUSIONS:
Heraeus Kulzer claims that Flexitime differs from other addition silicone impression materials in that its setting is initiated by exposing to intraoral temperatures. Clinical evaluators did not find that having the working time unrelated to the beginning of the material s set was not a significant advantage because most reported working fast enough that they had more than enough time to mix the material and insert the tray. They did, however, confirm the manufacturer s claim that Flexitime set fast once placed in the mouth. They particularly appreciated this aspect of the product s performance. Other handling characteristics such as resistance to slumping, viscosity, ease of removing impressions, and tear strength received very good marks from the users. They also noted that the material's colors made it easier to read critical areas of the impression. They were bothered by the fact that the kit contains only one gun which makes it impossible to mix the tray and wash viscosities of the material simultaneously during impression making. **Flexitime Impression Material** is rated **Acceptable** for use by the federal dental services.

(Col Charlton)

63-21 Disposable Prophy Angles (Project 99-39)

A disposable prophy angle (DPA) is a dental device that is used to polish teeth. It is driven by a dental motors through a doriot attachment. The DPA is to be used only once and is then discarded. All DPAs consist of three primary parts: 1) head (where the prophy cup is fastened), 2) body (which houses the internal mechanical parts), and 3) mandrel (which is inserted into the doriot attachment to transfer the rotation of the slow-speed handpiece to the rubber prophy cup). DPAs are made of plastic and are sold in different colors and cup flexibilities (e.g., ultra soft, soft, firm, etc.). DPAs are also manufactured that have cups that are latex-free and have different types of internal designs (e.g., webbed, ribbed, and square ribbed). The particular models evaluated in this project were determined by the manufacturers, who were asked to provide samples of their most popular brand. Five manufacturers participated in the project s laboratory evaluation and six participated in the clinical evaluation. Pertinent information for the evaluated models of prophy angles is provided in the following table.

Product Name and Model Evaluated	Manufacturer	Quantity	Retail Price	Government Price
AllPro model 801	AllPro, Inc. P.O. Box 733 6930 W. 116th Ave, #10 Broomfield, CO 80038 (303) 466-8911 (303) 466-8965 FAX	box of 100	$35.50 (36 cents each)	$23.50 (24 cents each)
Duropro model 1207	John L. Butler Co. 4635 West Forrest Ave Chicago, IL 60630 (773) 481-6898 (773) 777-1417 FAX www.jbutler.com	box of 200	$83.50 (42 cents each)	$67.20 (34 cents each)
Original Green model 501314	Denticator 13705 Shoreline Court East Earth City, MO 63045 (800) 227-3321 (314) 344-0021 FAX www.denticator.com	box of 144	$61.00 (42 cents each)	$39.50 (27 cents each)
Nupro Supreme model 965105	Dentsply Professional Division 1301 Smile Way York, PA 17404-0807 (800) 989-8825 (800) 278-4344 FAX www.dentsply.com	box of 100	$58.00 (58 cents each)	$34.00 (34 cents each)
Pivot model 1100013	Preventech 1207 Crews Rd. Suite C Matthews, NC 28105 (704) 849-2416 (704) 849-2417 FAX www.preventech.com	box of 144	$57.00 (40 cents each)	$34.00 (24 cents each)
Young Junior model 131420	Young Dental Mfg 13705 Shoreline Court East Earth City, MO 63045 (314) 344-0010 (314) 344-0021 FAX www.youngdental.com	box of 200	$100.00 (50 cents each)	$65.00 (33 cents each)

ADVANTAGES:
+ The need for maintaining and sterilizing prophy angles is eliminated.
+ A new angle is available for use every time.
+ Consistent with the unit-dose concept and practice.
+ Latex-free cups available.
+ May reduce the potential for cross contamination.
+ Eliminates the need to purchase separate prophy angle heads and cups.
+ Provided in a sealed package for patient presentation.
+ Some brands are available with the prophy paste pre-packaged with the angle.

DISADVANTAGES:
- May be more expensive to use than reusable prophy angles.
- May vibrate and make more noise than reusable prophy angles.
- Potential exists to need more than one angle to complete patients with heavy stain.
- Initial purchase of doriot attachments is required.

SUMMARY AND CONCLUSIONS:
The use of disposable prophy angles is increasing within the dental profession. The DIS laboratory evaluation, based on the draft ANSI/ADA Specification 85 Disposable Prophy Angles, found all DPAs in this evaluation functioned well and satisfied the basic requirement of removal of stain and dental plaque. They can be considered acceptable alternatives to standard reusable prophy angles. Based on the overall clinical evaluators responses, the Dentsply Nupro Supreme, Young Junior, and Preventech Pivot models were slightly preferred over the Butler Duropro, AllPro, and Denticator Original Green DPAs. However, the ones least preferred still scored good to excellent in the clinical evaluation. The **Denticator Original Green, AllPro, Preventech Pivot, Young Junior, Butler Duropro, and Dentsply Nupro Supreme** are all rated **Acceptable** for use by the federal dental service.

(MSgt Belde, Col Leonard, Mr Dan King, and Mr Joe Laforge)

LABORATORY

63-22 VaporJet (Project 01-05)

The VaporJet is a high-pressure, air/water spray gun that is purported to allow the user to combine some functions of a steam cleaner and an ultrasonic unit without leaving the dental laboratory workstation. The manufacturer claims that the VaporJet removes indicating spray, metal shavings, porcelain dust, and slurry stone from trimmed casts. Other advertised uses include cooling metal and wax during fabrication procedures and spraying debubblizer solution into impressions before pouring. The VaporJet consists of a one-liter capacity plastic reservoir (bottle), liquid regulator, air hose, and two-stage air gun. A dual-action trigger allows the user to spray air if half depressed and an air/water mixture if fully depressed. The reservoir can be filled with water or debubblizer solution. Air pressure to the reservoir is controlled by an in-line pressure regulator. The VaporJet is self-contained and attaches to the laboratory's existing pressurized air line. The manufacturer recommends that laboratory air pressure be between 80 and 90 psi.

Manufacturer:
Whip Mix Corporation
361 Farmington Avenue
P.O. Box 17183
Louisville, KY 40217-0183
(800) 626-5651
(502) 637-1451
(502) 634-4512 FAX
www.whipmix.com

Suggested Retail Price:
$230.80

Government Price:
$163.07: Contiguous United States
$171.20: Alaska, Puerto Rico, Hawaii

ADVANTAGES:
+ Effectively removes slurry from cast, porcelain dust after contouring, and indicating spray from casts and metal.
+ Helpful for technicians doing a large number of metal substructure seatings.
+ Saves time when mounted next to the workstation.
+ Provides air and air/water spray from one gun.

DISADVANTAGES:
- Does not effectively remove disclosing wax, polishing paste, or articulating tape markings.
- Only has one reservoir bottle so it can deliver only one kind of liquid at a time.
- Can create a safety hazard if overspray makes the floor slippery.
- Needs an adapter to install it to a laboratory air line.

SUMMARY AND CONCLUSIONS:
Evaluators found that when installed at the workstation, the VaporJet was a timesaving tool and is effective at cleaning slurry after trimming casts, removing indicating spray from dies and metal, and cleaning porcelain dust after contouring. The VaporJet is not a replacement for the steam cleaner or ultrasonic unit, because it does not remove materials such as disclosing wax, polishing paste, and articulating tape marks. Users expressed a safety concern because overspray can produce a slipping hazard on the surrounding floor. Technicians who perform multiple tasks daily involving indicating sprays, stone dust, porcelain contouring, or model trimming can benefit by having VaporJet installed at the location where these tasks are performed. The **VaporJet** is rated **Acceptable** for use by the federal dental services.

(MSgt Osborn)

INFECTION CONTROL

63-23 MicroCLEAR (Project 01-17)

MicroCLEAR is a chlorine dioxide-based dental unit waterline cleaner made for units that have a self-contained water system. The chemical treatment involves using the product initially as a cleaning agent (full strength, overnight application), followed by daily use (1:10 dilution, continuous application). The manufacturer claims that the product reduces bacterial contamination to less than 200 colony forming units per milliliter, meeting the American Dental Association s (ADA) goal for microbiological quality of dental treatment water. The manufacturer notes that MicroCLEAR is easy to use, pH balanced, odorless, tasteless, non-toxic, non-staining, non-corrosive to dental equipment, and does not affect bond strength. The product is available in one-gallon containers with an accompanying pump.

Manufacturer:
Rowpar Pharmaceuticals, Inc.
7720 E. Evans, Suite 208
Scottsdale, AZ 85260
(800) 643-3337
(480) 948-5918 FAX
www.rowpar.com

Suggested Retail Price:
$35.00 Two 1-gallon containers

Government Price:
$26.25 Two 1-gallon containers

ADVANTAGES:
+ Produced water quality that met ADA s goal.
+ Simple to use.
+ Saves time.
+ No evidence of clumping or residue.
+ No clogging of waterlines noted.
+ Only small amount needed for daily application.
+ Can be used with any type of separate water reservoir.
+ Simple instructions.
+ Easy to dispense using spigot provided.

DISADVANTAGES:
- More expensive than using diluted bleach for waterline disinfection.

SUMMARY AND CONCLUSIONS:
MicroCLEAR s handling properties and clinical acceptability were rated as Excellent. During the four-week test period, all tested water samples met the ADA goal for unfiltered output water. The product requires no mixing and uses only 2.5 ounces of solution for daily treatment of each dental unit. The main disadvantage was increased cost as compared to using diluted bleach for waterline disinfection.

MicroCLEAR is rated **Acceptable** for use by the federal dental services.

(Col Bartoloni)